

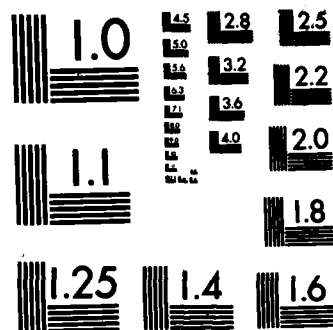
AN INFORMATION SYSTEM FOR KOREAN MILITARY PERSONNEL
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THESIS

AN INFORMATION SYSTEM FOR KOREAN
MILITARY PERSONNEL MANAGEMENT

by
Gwang U Bak
and
Chong Hun Kim
December 1982

Thesis Advisor:

Norman R. Lyons

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An Information System for Korean Military Personnel
Management

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ABSTRACT

A personnel information system is designed for the management of Korean military officer personnel. The objective of this thesis is to apply the computer-based personnel information system in the area of military officer personnel management. Personnel systems of the Korean military are defined, and input/output requirements of the system are stated. A data base for the personnel system requirement is formulated. A personnel information system for the Korean military officer personnel management is developed. The processing of the system is described and flow charts of the system are included. Impacts which are caused by the computer-based personnel information system in Korean military are discussed.

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I. INTRODUCTION

The Korean military, which consists of 600,000 personnel, is the largest organization in Korea. In national security the position of the Korean military is very important because Korea stands face to face with communist North Korea. In order to strengthen the war potential of the Korean military, it is imperative that personnel management be performed very efficiently. However, to manually manage all military personnel is a very tedious, complex, and time-consuming job. It is difficult for the present system to keep step with other computerized systems. On the other hand, the top-level officers of the Korean military are very interested in the Management Information System area and just recently computers were supplied to the Military and computer-based systems have been utilized very efficiently in several areas; e.g. Munitions Management. A new computerized personnel information system is required for the personnel management of the Korean military. This thesis will focus on the personnel information system for military officers. Section III defines the information system, personnel information system, and objectives of the military personnel information system. Section IV addresses how the system for personnel management of officers is organized, how to train officers, how to assign them, how to promote, and how to retire. Section V addresses the building of the

information system for the Korean military personnel management. That is, system requirements, preparation of data, how to perform file management, etc. Section VI addresses how to use the system, Section VII discusses impacts caused by the personnel information system. The impacts will be discussed classifying them according to positive and negative. Finally, Section VIII presents conclusions and recommendations based on the research presented in this thesis.

II. BACKGROUND (THE HISTORY OF THE KOREAN MILITARY)

A short discussion of the history of the Korean Military will give some familiarity into the system's characteristics. Korea is located in the Far East of Asia. The name, "Korea" is derived from that of an old dynasty, Koryo, which may be translated as "the land of high mountains and sparkling streams." These are apt epitomizations of the topography and geophysical features of the Korean peninsula, which is for the most part a succession of hills and valleys. The total area of the peninsula is about 220,000 square kilometers. Korea has a glorious history of 5,000 years. But, unfortunately, Korea was ruled for thirty-six years by Japan. Korea regained its independence in 1945. Korea was divided into the South and the North. In 1948, the Republic of Korea (ROK) was established in the South. The history of the Korean Military begins from that time. The Republic of Korea's military consists of the army, the navy, which includes a marine corps, and the air force.

A. THE ROK ARMY

The ROK Army uses the general staff system of the United States field armies, corps, and divisions, namely, G-1, personnel G-2, intelligence; G-3, plans and operations; and G-4, logistics. The ROK Army Headquarters has the responsibility for organizing, training and equipping ROK ground forces for

the conduct of sustained combat operations. In 1948, the national assembly passed a law requiring the organization of a National armed force. In accordance with this provision, the Ministry of National Defense was created. Army, Navy and Air Force Headquarters were put under the Defense Ministry. Various service branches were established in accordance with the law for the Organization of the National Army. These are; cavalry, artillery, engineer, signal corps, commissary, accounting, ordinance, aide, inspection, medical corps, military police, aviation corps, and general staff. At the same time, six regiments and two brigades were established. During the Korean war (1950-1953), the army gained considerable combat experience and units of the army were extended into twenty active divisions of about 13,000 officers and men each, and organized into five corps. During the Military Revolution (1961-1962), the Military government accomplished the basis of the development of the Korean economy. According to the strengthened national power, all equipment of the Army is modernized. The army is organized into three field armies, five corps, and consist of 520,000 officers and men.

B. THE ROK NAVY

The nucleus of the modern ROK Navy is the 2,000-man Coast Guard which was converted into the Navy in 1948. During the Korean War, it gained considerable experience in patrolling and mine sweeping. It was enlarged to a strength of about 16,880 and one fleet. Almost all vessels were formerly

United States ships. The ROK Marine Corps consists of one division, similar to the U.S. Marine Corps. After the Military Revolution, the Navy was modernized. The navy consists of 49,000 officers and men including the Marine Corps. The Marine Corps was organized into one division and two brigades of about 24,000 officers and men. The Navy uses the system similar to a U.S. Navy system.

C. THE ROK AIR FORCE

Army Aviation was converted into the Air Force in 1949. At that time the Air Force possessed twenty operational aircraft, all trainers. During the Korean War, it gained considerable experience in combat flying skill and was increased to a strength of about 23,000, and two fighter wings with eighty F-86 aircraft, and a transport squadron with C-46 aircraft. After the Military Revolution, the air force was also modernized. The Air Force consists of 32,600 officers and men. It is organized into 4 combat wings with F-5 and F-4 aircrafts and 1 transportation wing with C-54 and C-123 aircraft.

III. THE PERSONNEL INFORMATION SYSTEM

A. INFORMATION SYSTEM

1. Definition

An information system is defined as follows:

"An organization set of components designed to produce intelligence required for decision making." {Ref. 4}

"A group of data processing procedures built around the representation of data, in which there is a minimum of duplicate operations, such as entering the same data more than once." {Ref. 6}

"A combination of human and computer-based resources which results in the collection, storage, retrieval, communication and use of data for the purpose of efficient management (planning, decision-making, reporting and control) of operations in organizations." {Ref. 7}

Thus, the ultimate objective of an information system is "to provide the user with information needed." The system itself has four main components; input, output, computer, and programs. The relationship between these parts is shown in Figure 1.

2. The Functions of Information Systems

Regardless of the type of organization served or the type of hardware used, an information system performs the following functions {Ref. 6} :

- Data Collection: Observing and recording events and transactions for further analysis and evaluation.
- Data conversion: Changing data contained on an original document into a more suitable form for processing or storage.

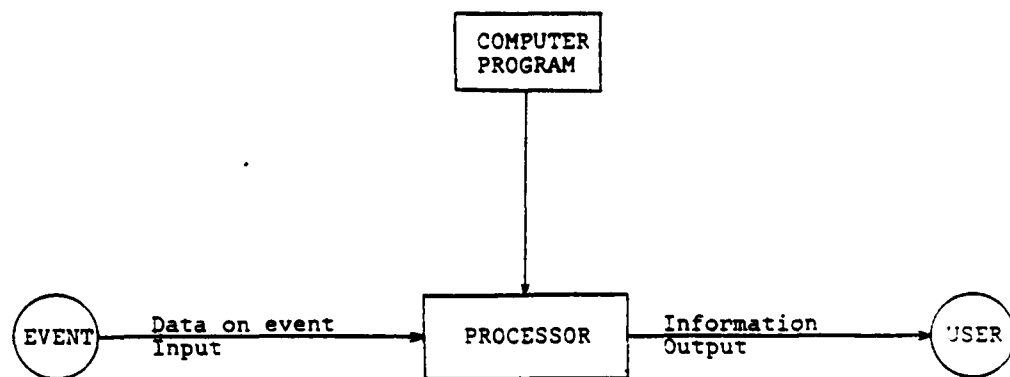


Figure 1. Main Components of an Information System

- Data transmission: The process of moving data from one location to another by physical or electrical means.
- Data representation: Representing data in a machine readable form so as to facilitate processing.
- Data organization: Arranging data in the form of files, records etc., so that they can be processed and retrieved efficiently and economically.
- Data Storage: Storage of data on appropriate media so that they will be easily accessible to the central processor.
- Data manipulation: Selecting, sorting, merging, and editing data so as to facilitate further processing.
- Data Calculation: Performing various arithmetic and logical operations on data so as to produce desired information outputs.
- Information retrieval and display: Retrieving information, or processed data, from information storage, and making it available in the proper format and medium at the right time to interested users.

B. PERSONNEL INFORMATION SYSTEM

A personnel information system is necessary "to provide information, about what is happening to people; their recruitment, promotion, assignment, retirement, and so on, to personnel management." The personnel information system provides "integrated personnel planning and decision making information rather than fragmented record keeping." (Ref. 15)

A flow of the information is shown in Figure 2. In order to define a personnel information system in more detail, we describe the system with the following example as developed by the Civil Service Department, London, England. {Ref. 14}

- Personnel Information System (PRISM)

A much broader information base was needed to meet more fully the requirements of the rapidly developing personnel management and manpower planning services. In other words, it had to be a replacement system for the obsolete CSCSR (The Civil Service Central Staff Record), but it was only required to meet the information needs of the center, that is, the Civil Service Department and Treasury, but also the personnel management requirements of the individual ministries. The new system, which came to be known as Personnel Record Information System for Management (PRISM), has these key features:

- * It is an integrated pay and personnel record system.
- * It operates as a two-level data base system with both levels of management, central and departmental.
- * The central record is maintained as a collection of 500,000 individual personnel records, and no attempt is made to hold any form of summary records.
- * It is maintained on true data base principles, that is, single notification of occurrences, data base recording, and multiple output.

A schematic diagram of the two-level data base (or data bank) system is given in Figure 3, which shows the central

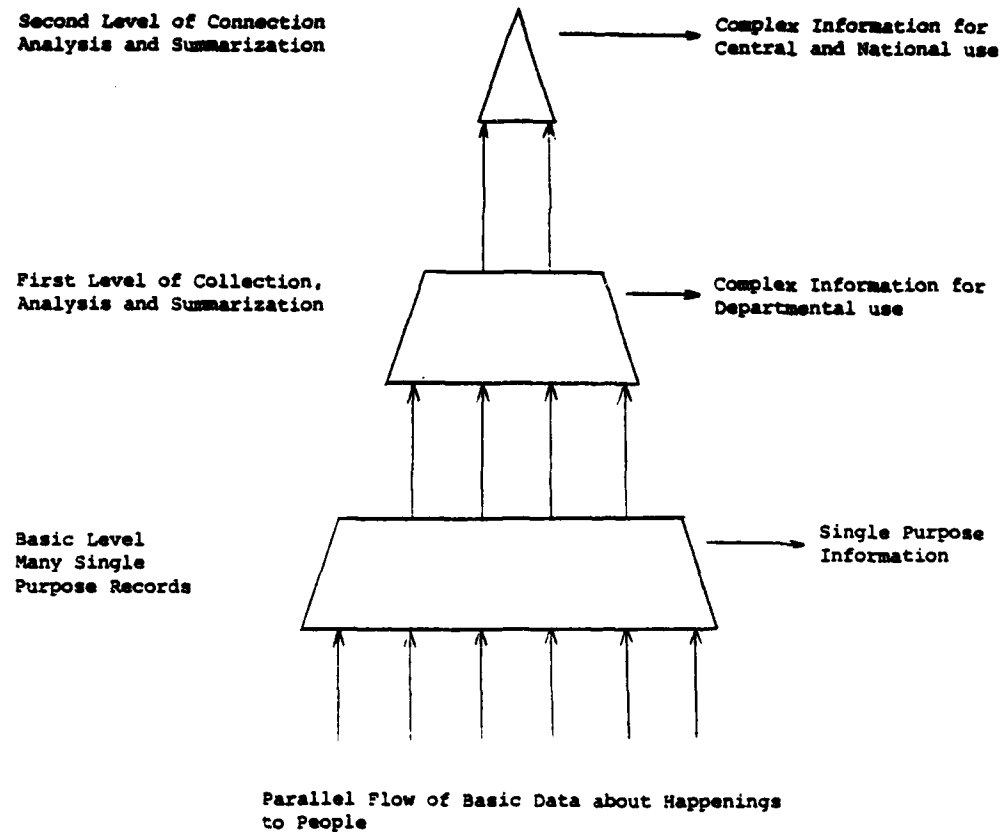
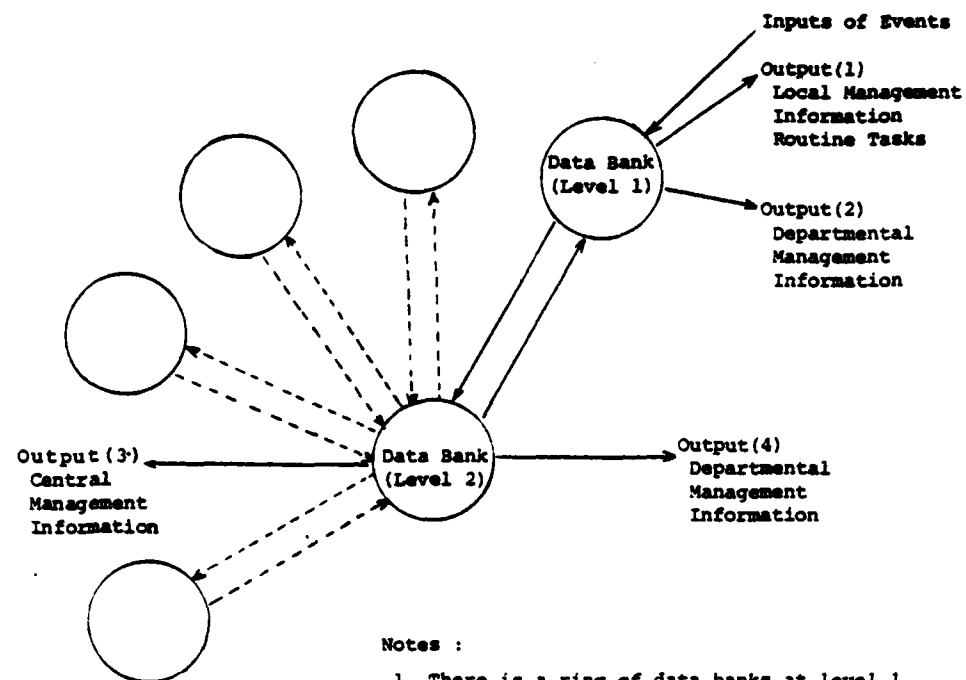


Figure 2. Orthodox Personnel Information Service Flow



Notes :

1. There is a ring of data banks at level 1, but only a single level 2 data bank.
2. Each data bank at level 1 serves a number of peripheral points.

Figure 3. Civil Service Personnel Information System:
(Schematic diagram of information flow for network system)

data base being fed with information automatically from the ring of peripheral computers. There will be nine or ten such peripheral machines maintaining an integrated pay and personnel record system for the various ministries (departments). The basic PRISM philosophy is to answer any question automatically and quickly within the logical derivations of the data recorded. The intention is that a user will sit at a remote terminal (a Visual Display Unit (VDU)) and, by having an interactive dialogue with the computer, progressively obtain from the huge mass of stored data the relatively small piece of useful information he requires. Consequently, it needs to be stressed that PRISM is not an end in itself; it is a tool to be used by managers and planners to enable them to do their work better.

C. MILITARY PERSONNEL INFORMATION SYSTEM

The Military Personnel Information System supports the varying military personnel information requirements at each level of the active armed force from the unit level to each HQ. {Ref. 13} The system is developed for the following purpose:

- To develop personnel information systems and computerized personnel management tools to support planning, programming, policy determination, and personnel operations connected with the procurement, training, distribution, sustainment, and separation of military personnel.

- To achieve disciplined, functionally controlled, integrated, and flexible automated systems to provide timely and accurate personnel information required by Headquarters, and commanders and staffs at all echelons.
- To achieve personnel information systems employing standardized data elements and codes, equipment, and formats so that an interface may be achieved with all personnel applications at all echelons of the armed forces.
- To achieve responsiveness from personnel information systems appropriate to support the needs of the echelon concerned.
- To attain a single source of input for each category of information and automation of input at the source.
- To eliminate manually maintained hard copy personnel records.
- To develop improved quality control techniques.

IV. PERSONNEL SYSTEMS OF THE KOREAN MILITARY

There are four systems for officers in each armed force of the Korean Military; Source system, Assignment system, Promotion system, and Retirement system. {Ref. 1,2 }

A. SOURCE SYSTEM

There are commonly three main sources for officers in each armed force; Academy, O.C.S., and R.O.T.C.

1. Academy

There are four academies in Korea; Military Academy, Naval Academy, Air Force Academy, and Military Nurse Academy. The cadets are chosen from applicants who have graduated from senior high school. The training duration is four years. After the cadets complete the training, they are commissioned as second lieutenants.

2. O.C.S. (Officer Candidate School)

The Students are chosen from applicants who have graduated from a university in order to supplement the officers in the technical and administrative area. The training duration is twelve weeks. After the students complete the training, they are commissioned as second lieutenants.

3. R.O.T.C. (Reserved Officer Training Course)

The student military training corps are set up at all universities in Korea. The students are chosen from applicants who complete the sophomore year. The Corps trains the students

through military drills during two years (junior and senior year). After they complete the military and have graduated from the university, they are commissioned as second lieutenants in the reserved officer corps of each armed force. They are called into each armed force for two years. If they want to become a regular officer, they are enrolled to the regular officer corps.

B. ASSIGNMENT SYSTEM

This system assigns officers into the active units when new officers are commissioned or will exchange active officers, who have finished their tour according to the regulation of each armed force. They are divided between two units; front army and rear army in the Army, and four fighter wings in the Air force.

1. New Officer Assignment System

This system first will estimate required personnel by unit through required personnel from lower units and billets master file. Required Personnel will be classified according to a unit, a branch of the military service and a priority of position. According to this priority, new officers will be assigned into the active unit with orders of military service number.

2. Active Officer Assignment System

Service units are classified into several types according to each armed force. In the Army, service units are classified into two types; front units and rear units.

After an active officer works at one unit for four years, he is ordered to another unit. In the Air force, a service unit is classified according to the fighter wing. The exchange of active officers among the fighter wings is carried out by the requirements of the Air force disregarding the regular duration. Therefore, for this operation, this system will be designed to estimate officers who finish their service duration in a unit, or decide upon officers who will be exchanged to other wings by the regulations of the Air force through a personnel master file, billet master file and required personnel from lower units. In addition, this system will be designed to estimate the positions in each unit which will be unoccupied through the billet master file. The exchange between two units will be quarterly. This system will assign officers into each unit with the expiration date of his position according to the priority of the position.

C. PROMOTION SYSTEM

In the Korean armed forces, the promotion policy is that personnel, who finish the minimum service duration for promotion and who possess the capability to perform in the upper level position, be reviewed by a promotion selection committee. Therefore, this system will be designed to provide needed promotion information to the decision maker, namely the promotion selection committee. By this system, the list of personnel who should be promoted will be provided according to each rank and each branch of service. The promotion marks of all

personnel will be provided by converting several items into these marks. Several items are as follows:

- career which is required on current rank.
- The result of fitness reports which is taken annually on current rank.
- Military education
- Rewards and punishments.
- Class of physical condition
- The order of promotion recommended by commander.

A promotion selection committee will select the officers to be promoted each year from officers who are recommended for promotion, according to the above information and the necessary number of officers determined by the number of vacant positions. The officers to be promoted the following year are decided upon at the end of each year; between November and December. They are promoted to each rank at the first of the month according to their seniority.

- promotion minimum service duration

<u>Rank</u>	<u>Minimum Regular Periods</u>
2nd Lt.	1 yr
1st Lt.	3 yrs
CAPT.	5 yrs
MAJOR	4 yrs
LT COL.	4 yrs
COL.	4 yrs
BRIG. GENERAL	2 yrs

D. RETIREMENT SYSTEM

In the Korean Military, officers who have served a minimum of 20 years have the right to retire. Officers requesting retirement from the Military service send a completed retirement request to the Personnel Bureau three months before the desired retirement day. The officer will then retire from military service on the desired day. If he does not wish to retire from the Military service, he may continue on active duty. However, if he reaches the age limit, rank limit, or service limit, he must retire on the day he reaches the first limit. Limits of each rank are as follows:

<u>Rank</u>	<u>Rank Limit</u>	<u>Age Limit</u>	<u>Service Limit</u>
CAPT	8 yrs	43	20
MAJOR	8 yrs	43	20
LTCOL	8 yrs	47	24
COL.	8 yrs	52	27
BRIG. General	6 yrs	60	None

Therefore, this system will be designed to provide needed retirement information to the decision maker; the Retirement Selection Committee. The system will provide a list of officers who reach a retirement limit, or the list of officers who wish to retire, through a retirement master file.

V. AN INFORMATION SYSTEM FOR
KOREAN OFFICER PERSONNEL MANAGEMENT

A. SYSTEM REQUIREMENTS

The system required output and input.

1. Output

There are three types of desired output in the system {Ref. 9} : Assignment Output, Promotion Output and Retirement Output.

a. Assignment Output

This output will be required to provide a listing of active officers to be exchanged between two units (front and rear units in the Army, the fighter wings in the Air force), a listing of unoccupied positions in each unit, and a listing of new officers to be assigned into active units. These output formats are shown in Appendix A.

b. Promotion Output

This output will be required to provide a listing of officers who meet the criteria to be promoted and for a listing of officers who are selected to be promoted the following year. These output formats are shown in Appendix B.

c. Retirement Output

This output will be required to list all retirement information. These output formats are shown in Appendix C.

2. Input

Input will be used to create, update, modify, or change the data base. {Ref. 4}

a. Data Base

The data base will consist of the personnel file, promotion file, and billet file.

- Personnel file.

Each officer will have a record in the Personnel master file. The record will be 129 characters in length. It will contain personal data, service career data, physical data, function data, and military educational data.

- Promotion file

Each officer will also have a record in the promotion file. The record will be 59 characters in length. It will contain personnel data, fitness report data, reward and punishment data, and the order recommended for promotion by commander.

- Billet file

Each position in each unit will have a record in the billets master file. The record will be 57 characters in length. It will contain position data and data of personnel who occupy the position.

b. Input Sources

- Personal data

This data will be obtained through the following sources:

- * Raw material; Personal written documentation written at time of commissioning.

- * Personal record change report; it is written when an officer is promoted, has changed his position, or finished military or civilian education.

- * Physical Fitness report

This data will be updated when this source is reported.

- Promotion data

This data will be obtained through the following sources:

- * Fitness reports

- * Reward and Punishment report

- * The report of the order recommended for promotion by commander.

This data will be updated when these sources are reported.

- Billet data

This data will be obtained through the organization table, and each unit's regulation and SOP. This data will be updated when the unit is increased or decreased, when the unit is established or disestablished, and when the organization table is revised.

- c. Input Device

In the Military, system cards will be widely used for input. An optical scanner and a keypunch will be required

when cards are produced from a document. For off-line input, magnetic tape encoder will be used as the document to be encoded on magnetic tape. For on-line input, terminals (CRT) will be used. {Ref. 4}

B. DATA COLLECTION

Data collection means the gathering of original data to be entered into the information system. {Ref. 8} There are four major data collection methods in common use today: manual, mechanical, electro-mechanical, electronic. These methods are classified into two general categories, online and offline collection. These methods are shown in figure 4. {Ref. 4} Original input in machine-readable form collected by online equipment can be validated by the intelligence capability of the terminal or it can be checked for accuracy by programs when entering the data base. This is also the case with offline data in machine-readable form.

In the Korean Military Information System, data collection will mainly be done by means of documents for future years. This data is gathered from the lowest level administrative unit to the Headquarters Personnel Bureau of each armed force through the command channel. Data gathered in the middle level unit, is integrated and reported to upper level units if the data must be integrated. If integration is not necessary, the data is directly transmitted to upper level units. Finally, the Personnel Bureau of each armed force gathers the data from lower level units, and converts the data into

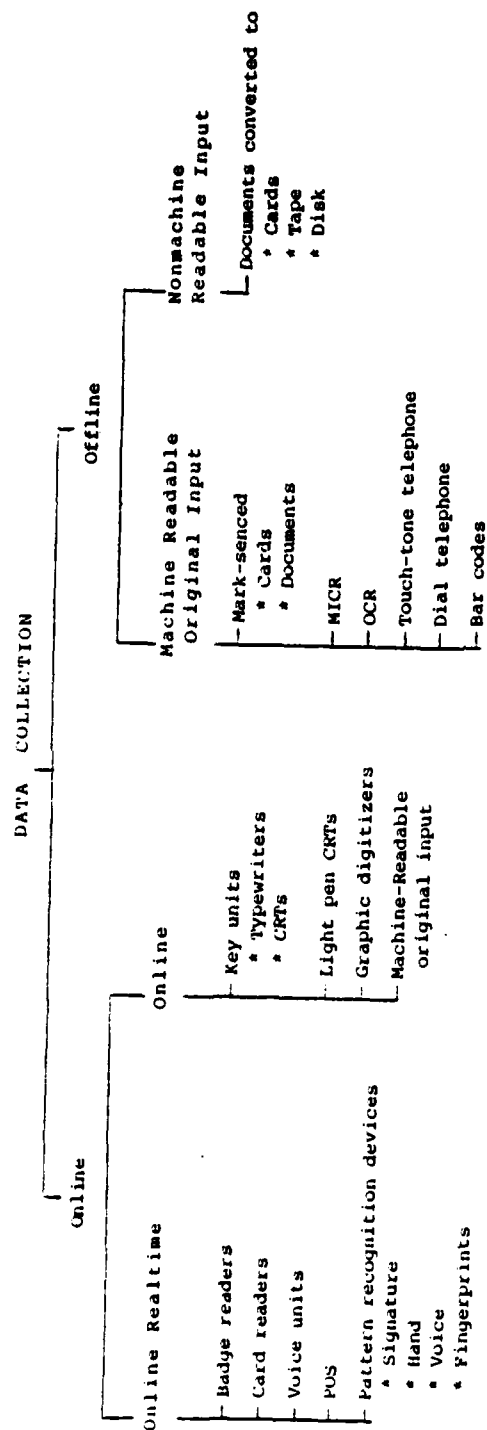


Figure 4. Data Collection

machine-readable form such as cards, disks, or tape for entry into the data base. All data have a prescribed format.

C. DATA AND DATA ELEMENT

Data is any representation such as characters, analog quantities or other stimuli to which meaning might be assigned. A data element is a fact or observation collected and recorded as data; a character, data items, groups of data items, or any other set of data which, in the context of the discussion, are considered as a single unit. In the Korean Military Personnel Information System for officers data is classified into personnel data, promotion data, and billet data. {Ref. 3}

All data consists of several data elements:

1. Personal Data

- The military service number (ID)
- The rank and the date
- Name
- Date of Birth
- Branch of the Military service
- Classification of Military origin
- One's domicile or origin
- Date of entrance into office
- Military profession
- A career
- Service duration on the troops in the rear and front (army only)
- Military education

- Civilian education
- Physical condition
- Flying hours (Air force and Army Aviation)
- Current position and unit
- Foreign language capacity

2. Promotion Data

- The Military service number (ID)
- The rank
- Name
- Branch of the Military service
- Service fitness
- Physical condition
- Reward and punishment
- Promotion order recommended
- Yes or no of promotion

3. Billet Data

- Unit
- Position
- Branch of Military service required
- Rank required
- Military profession required
- Completion of Military education required
- Completion of civilian education required
- Assigned duration to the position
- Assigned condition
- Foreign language required
- Personnel data of officer occupying the position

D. DATA ORGANIZATION

There are two types of organization in the military system; logical and physical. {Ref. 12}

1. Logical Organization

Logical organization is the grouping of data elements according to the user's view of data interrelationships for the purpose of input and output. Therefore, if data elements are required to produce a specified output such as section 3, then a record is formed by joining the related data elements with one another. All related records are then grouped into a file. In order to consolidate and integrate data records formerly stored in several separate data files, a common data base is formed.

a. Record

There are three records in the system: 1) Personnel Record, 2) Promotion Record and 3) Billet Record.

(1) Personal Record. Each officer has a personnel record. This record consists of personnel data elements; Military service number, rank, name, career, and others.

(2) Promotion Record. Each officer has a promotion record. This record consists of promotion data elements; Military service number, rank, name, service fitness, reward and punishment,...etc.

(3) Billet Record. Each unit position has a billet record. This record consists of billet data elements unit, position, rank required, a branch of service required,...etc.

b. File

A file is a collection of related data records treated as a unit. There are three files in the system;

1) Personnel File, 2) Promotion File, and 3) Billets File.

(1) Personnel File. This file will be a collection of all personnel records.

(2) Promotion File. This file will be a collection of all promotion records.

(3) Billets File. This file will be a collection of all billet records.

c. Data Base

When these data files, personnel files, promotion files and billets files are integrated and linked to share data, they form a common data base. The data base consists of linked files. The data elements, "Military number", "Rank", "Name", "Unit" and "Position", appear in each file. They enable the computer to integrate information in separate files. The data organization from data element to data base is shown in Figure 5.

2. Physical Organization

Some logical records are long, requiring many physical units of data, units such as cards. These units are called physical records. Physical records are grouped into physical files just as logical records are grouped into logical files. Data elements are organized into a hierarchy of data. The hierarchy of data can be further disaggregated into a set of

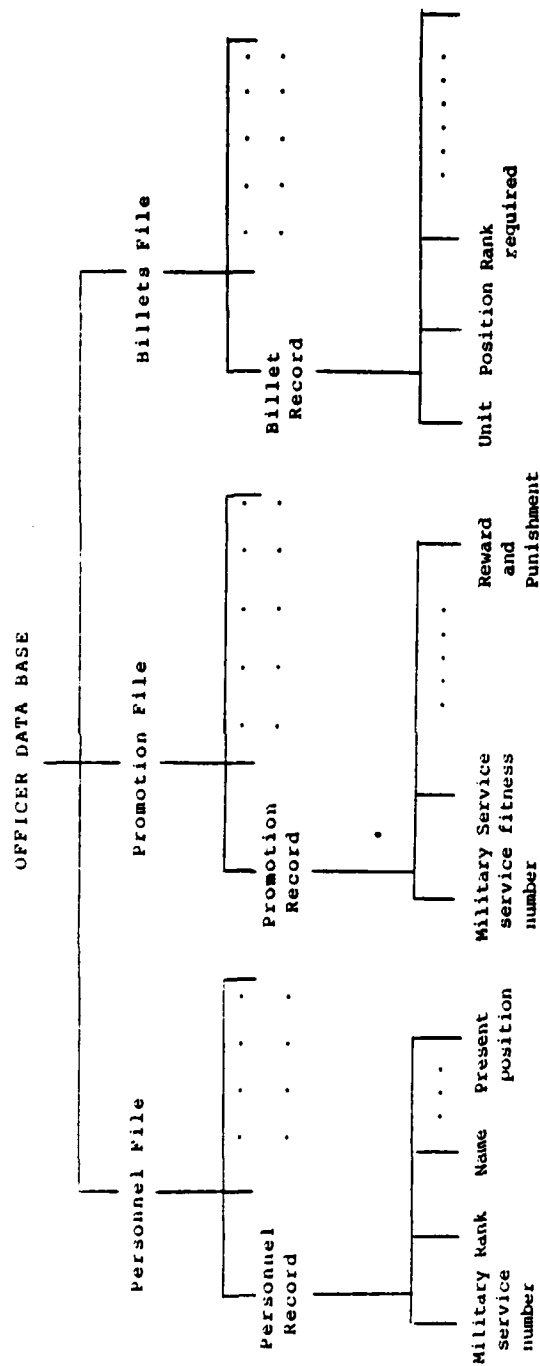


Figure 5. Data Organization

characters. The characters may be alphabetic (a-z), numeric (0-9), alphanumeric, or special character symbol (/ , * , % , #). A character is represented by a set of bytes, each byte consisting of bits (binary digit). Ref. 4 There are generally 8 bits to a byte and 16 bits to a word in the Korean Military System. Bytes are aggregated further into words for efficient access on storage devices. In order to allocate a group of data elements on a physical record, the group data element has a field. The field may consist of several subfields. It is shown in Figure 6.

E. DESCRIPTION OF FILES

The following narrative describes the record layouts of each of the files in the data base. The field number, field name, field type, and field length in characters are given.

1. Personnel File

Each record in this file has the following description:

<u>Field No.</u>	<u>Field Name</u>	<u>Field Type</u>	<u>Field Length</u>
1	The Military Service Number	N	6
2	Rank		
	Rank	A/N	3
	Promoted Date	N	4
3	Name		
	Last	A	5
	First	A	10

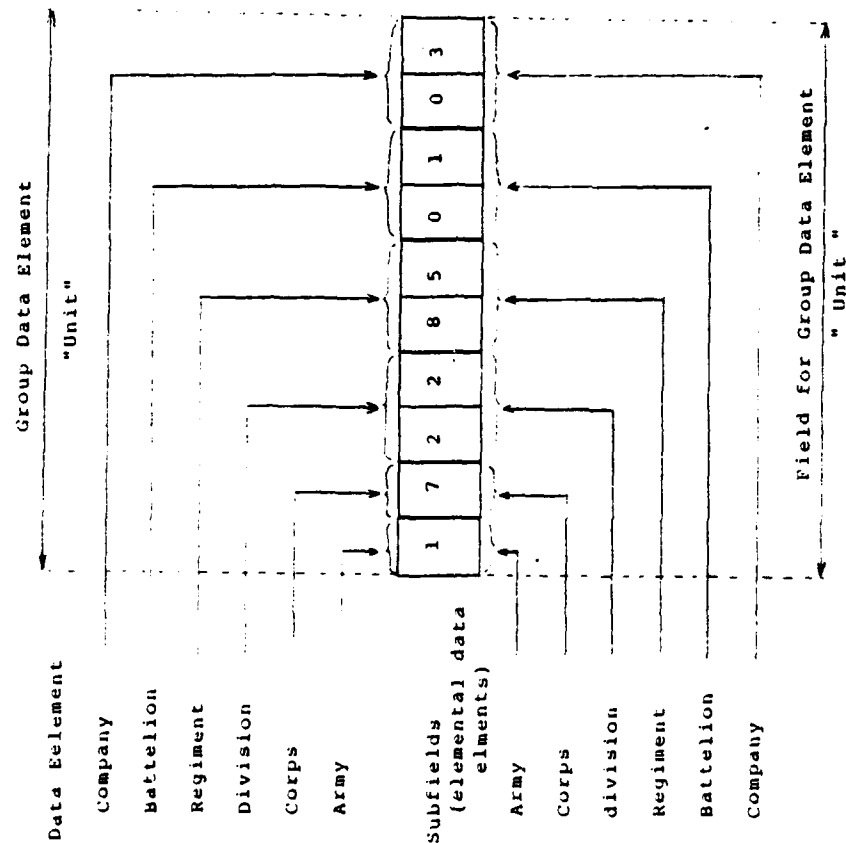


Figure 6. Field and Subfield for Data Element (example)

<u>Field No.</u>	<u>Field Name</u>	<u>Field Type</u>	<u>Field Length</u>
4	Date of Birth		
	Year	N	4
	Month	N	2
	Day	N	2
5	Branch of the Military Service	A	2
	(Ex: Infantry: IF)		
6	Classification of Military Origin	N	1
	EX: Academy: 1		
	O.C.S: 2		
	R.O.T.C: 3		
7	Commissioned Date	N	8
8	One's Domicile of Origin	N	2
	EX: Seoul: 01		
	Busan: 02		
	Chon Buk: 03		
9	Military Profession	N	3
	EX: Operation: 300		
	Information: 200		
	Command: 003		
10	A Career		
	Platoon Leader	A	1
	Company Commander	A	1
	Battalion Staff	N	2
	Battalion Commander	A	1

<u>Field No.</u>	<u>Field Name</u>	<u>Field Type</u>	<u>Field Length</u>
	Regiment Staff	N	2
	Regiment Commander	A	1
	Brigade Staff	N	2
	Division Staff/Wings Staff	N	2
	Corps Staff	N	2
	Brigade Commander	A	1
	Division Commander/Wings	A	1
	Army Staff/TACC	N	2
	Army HQ Staff/Airforce HQ	N	2
	Army Commander/TACC	A	1
	The Chief of General Staff	A	1
	Other Staff		
	Unit	N	2
	Staff Office	n	2
	Position	N	2
	EX: Commander: Y or N		
	Staff		
	00: N/A		
	01: Personnel		
	02: Information		
11	Service Duration of the Latest		
	Rear Unit and Duration	N	3
	Front Unit and Duration	N	3
	EX: 000: N/A		
	104: The 1st Army and		
	: 4 years		

<u>Field No.</u>	<u>Field Name</u>	<u>Field Type</u>	<u>Field Length</u>
12	Military Education		
	O B C	N	1
	O A C	N	1
	Army College/Airforce	N	1
	Defense PostGraduate School	N	1
	EX: 0: N/A		
	1: Excellent Score		
	2: Average Score		
	3: Below Average Score		
13	Civilian Education	N	1
	EX: 0: N/A		
	1: Bachelor		
	2: Master		
	3: Ph D		
14	Physical Condition	N	1
15	Flying Hours		
	Kinds of Flight	N	2
	Hours	N	5
16	Present Position		
	Unit	N	10
	Position	N	4
17	Foreign Language Capacity		
	English	N	2
	French	N	2
	German	N	2

<u>Field No.</u>	<u>Field Name</u>	<u>Field Type</u>	<u>Field Length</u>
	Spanish	N	2
	Chinese	N	2
	Japanese	N	2
	Others	N	4

EX: 00: N/A

01: Comprehensive

11: Conversation and
Comprehensive

Total length of characters: 129

2. Promotion File

Each record in this file has the following description:

<u>Field No.</u>	<u>Field Name</u>	<u>Field Type</u>	<u>Field Length</u>
1	The Military Service Number	N	6
2	Rank		
	Rank	A/N	3
	Promotion Date	N	4
3	Name		
	Last	A	5
	First	A	10
4	Branch of the Military Service	A	2
5	Service Fitness		
	1st Result	N	1
	2nd Result	N	1
	3rd Result	N	1

<u>Field No.</u>	<u>Field Name</u>	<u>Field Type</u>	<u>Field Length</u>
	4th Result	N	1
	5th Result	N	1
	6th Result	N	1
	7th Result	N	1
	9th Result	N	1
	Average	N	1
	EX: 0: N/A		
	1: Excellent		
	2: Average		
	3: Below Average		
6	Physical Condition	N	1
7	Reward and Punishment		
	Reward		
	Regiment Commander	N	1
	Brigade Commander	N	1
	Division Commander/Wings	N	1
	Corps Commander	N	1
	Army Commander	N	1
	The Chief of Army/Airforce	N	1
	Minister of Defense	N	1
	Prime Minister	N	1
	President	N	1
	Decoration	N	2
	Punishment		
	Light Disciplinary	N	1

<u>Field No.</u>	<u>Field Name</u>	<u>Field Type</u>	<u>Field Length</u>
	Heavy Disciplinary	N	1
	Military Trial	N	1
	EX: 0: N/A		
	1: The Frequency		
8	Promotion Order Recommended		
	The Order	N	2
	Total	N	2
9	Yes or No of Promotion	A	1

Total Length of characters: 59

3. Billets File

Each record in this file has the following description:

<u>Field No.</u>	<u>Field Name</u>	<u>Field Type</u>	<u>Field Length</u>
1	Unit	N	10
2	Position	N	4
3	Branch of service required	A	2
4	Rank Required	A/N	3
5	Military Profession required	N	3
6	Military Education required	N	1
	EX: 0: N/A		
	2: O.A.C.		
	4: Army College		
7	Civilian Education required	N	1
	EX: 0: N/A		
	1: Bachelor		
	2: Master		

<u>Field No.</u>	<u>Field Name</u>	<u>Field Type</u>	<u>Field Length</u>
8	Duration of the Position EX: 18: 18 months	N	2
9	Assigned Condition EX: 0: Unoccupied 1: Occupied 2: Additional Post	N	1
10	Foreign Language required	N	2
11	Personnel Data		
	Military Service Number	N	6
	Rank	A/N	3
	Name	A	15
	Date of Assign	N	4

Total length of characters: 57

F. FILE ORGANIZATION

There are two major types to be classified by function in the military system: Master file and Transaction file. Ref. 6

1. Master File

This file is a group of related permanent records: Personnel records, Promotion records and Billet records. These records in the master-file must be updated periodically. That is, the master file contains all basic operational information and also contains current information on transactions by being regularly updated from the transaction file. The master file needs a back-up master in the event of accidental

master file loss due to operations, natural disasters such as fire or flood, and possible theft. Therefore, the back-up master consists of a father file and grandfather file. {Ref. 4}

- Son File: This file is the first generation of back-up current file. It is created from the father file.
- Father File: This file is the second generation back-up. It is created from the grandfather file.
- Grandfather File: This file serves as the third generation of backup.

2. Transaction File

This file is used to accumulate changes that are to be made in the master file.

G. FILE CREATION, RESTRUCTURING AND MAINTENANCE

1. File Creation

In the Korean Military Personnel Information System three files will be created for personnel management of officers by computer-based information system: personnel file, promotion file, and billets file. These files will be created from each officer's personal record card. In order to collect data, this card will be converted to special machine readable forms; special mark-sensed sheets or documents that are optically scanned. The data will be stored on storage media chosen for the new file. {Ref. 4}

2. File Restructuring

In file restructuring of the military system, an old file will be converted into a new one. Restructuring may

be triggered by the addition of data elements and subsequent expansion of a file, the need for additional width of one or more data elements, the rearrangement of data elements to facilitate processing, the need to change format to conform to a new standard form, or the need to revise an old file to make it complete and accurate. {Ref. 6}

3. File Maintenance

File maintenance of the Military Personnel Information System is necessary because of the day-to-day changes that take place in the personnel, promotion, or billet records. File maintenance refers to file processes necessary to modify the contents of an existing file; insert, delete, or change records within a file. Specific file maintenance functions include adding a record to a file, deleting a record from a file, changing the value of a file in a given record (e.g., correcting a spelling error, modifying a chain address), changing the structure of a record (as by adding or deleting fields, changing the length of fields, or changing the sequence in which fields are contained in a record), changing the sequence of records in a file (e.g., by sorting or merging), and changing the medium on which records are stored. Therefore, the file maintenance process involves adding, deleting or rearranging elements in the file. {Ref. 6} The data in the file of the system must be updated to provide exact personnel informations for the user, decision maker, or personnel management officer.

H. INFORMATION RETRIEVAL

An updated file will be integrated to answer special information requests or used as the basis for preparing periodic information reports. In the Military Personnel Information System, individual fields of a record usually can be extracted in the order specified by a user, or the entire record can be retrieved if so desired. {Ref. 5 }

1. Indexing for Information Retrieval

An index facilitates information retrieval for the military personnel information system, particularly when searching for an element with compound or long names, or when one has forgotten the exact title or spelling of the element. In such cases a KWIC (key word in context) or KWOC (key word out of context) index will be helpful. Therefore, KWIC will be used because it identifies in alphabetic sequence every data element word without changing the order of words in the Korean Military System.

2. The Use of Terminal Interactive Languages

The use of a terminal for data entry will be increased in the Korean Military System. In order to collect and retrieve data, therefore, terminal interactive languages (query language) will be used. {Ref. 4} The questioning which appears on the terminal may be as follows:

- Menu Selection:

In menu selection, the user is offered a list of choices. The advantage of this method of retrieval

is that no knowledge of the system or data base is required.

- Fill in the blanks:

A checklist of questions with blanks to be completed prods the user into supplying all of the necessary input in this method of data collection. This technique requires some training or knowledge to operate the system.

- Parametric Requests:

This technique is a form of dialogue between user and machine.

- Combined:

In this technique two or three, among the three methods are combined. In the Korean Military Personnel Information system, the questioning which combines one or two methods into menu selection will be used.

3. Report Generation and Display

In this system, data manipulation operations, such as sorting, merging, editing, and summarization of data contained in files, may be necessary before the user can obtain the information he needs in meaningful form. The mere retrieval of data contained in files is not sufficient to meet the requirements of the processing system user. After routine manipulation operations have been performed on files, the results of these operations can be presented to the user in

the form of tabulated reports, graphics, or combined. The display of processed data (ie, information) provides the user with a picture of the present status of the organization, activity, individual, or subject matter about which the file contains information.

I. INFORMATION SECURITY

In the Military Personnel Information System, personnel information, (personal information, promotion information, assignment information, and retirement information) should be protected from unauthorized access in order to preserve the order of military personnel management and to prevent the enemy from obtaining personnel information. Particularly, protecting personnel information from the enemy is very important because the enemy may recognize the units operation tendency if personnel information of the commander and staff were disclosed.

1. Security Threats

There are many possible threats to the Military Personnel Information System. These threats can be broadly classified as either malicious or accidental. Malicious threats are attempts to circumvent the security mechanisms designed into the system. Accidental threats include hardware and software failures that cause an installation's security policies to be enforced incorrectly, and include natural disasters such as flood and fire. These threats are as follows:

- Application programmer
 - Programming of applications to behave contrary to specification.
- Terminals
 - Located in secure environment.
- Terminal user
 - Fraudulent identification.
 - Illegal leakage of authorized information.
- Systems Programmer.
 - Bypassing security mechanisms.
 - Disabling security mechanisms
 - Installing system lacking in adequate security
- Operator
 - Duplication of confidential reports.
 - Initializing insecure system
 - Theft of confidential material.
- System software
 - Failure of protection mechanisms
 - Information leakage.
- System hardware
 - Failure of protection mechanisms
 - Contribution to software failure
- Data base
 - Unauthorized access
 - Copying
 - Theft
- Authorizer
 - Incorrect specification of security policy

2. Counter-Measures to Threats

In order to protect the information from these threats, three countermeasures are adopted: access control, auditing, and security policy.

a. Access Control

A user can protect information by placing the entire computer system in a locked room accessible only to him. In some of its installations the Korean military personnel bureau takes an approach somewhat similar to this by having three separate computer systems; one for top secret information, another for secret information, and yet another for confidential material. Usually, however, this extreme form of protection is not desirable. {Ref. 16} Therefore, three techniques will be used for enforcing access rights, access control matrix and list, passwords, and cryptography.

- Access control matrix and list

An access control matrix is a two-dimensional matrix. One dimension lists all users of the computer, the other dimension lists all files in the system as shown in Figure 7. Each entry in the matrix indicates that user's access to that file. The access control verification module compares the user's access request with his allowed access to the file, if they do not match, the access is not permitted. If there are many users and files in the system, a two-dimensional matrix will require many entries.

SEGMENT	USERS					
	Section of Planning	Section of personnel	Section of promotion	Section of Retirement	Section of Assignment
PERSONNEL FILE	R	RWE	R	RWE	RW	...
PROMOTION FILE	R	None	RWE	None	R	...
BILLETS FILE	R	RW	R	R	RWE	...

Access Control Matrix

FILE	ACL
PERSONNEL	Section of Planning(READ), Section of Personnel(ALL ACCESS) Section of Promotion(READ), Section of Retirement (ALL ACCESS), Section of Assignment (READ/WRITE), Others(NONE)
...

Access Control List

Figure 7. Access Control Matrix and List

In order to reduce number of entries, we may use an access control list as shown in Figure 7.

- Passwords

An alternative method for enforcing access control is through passwords. Associated with each file in the file directory is a password. The user requesting access to that file must provide the correct password.

- Cryptography

Both the password and the access control matrix methods are disadvantageous in that the "access keys" are permanently stored in the system. Another method is to cryptographically encode all files. All users may access the encoded files but only an authorized user knows the way to decode the contents. In the Korean Military System, these access control mechanisms will be used independently or in combination.

b. Auditing

Auditing is used to detect accidental errors. There are two approaches to auditing (Ref. 4): auditing around the computer, auditing through the computer.

- Auditing around the computer

In this approach, output is checked for a given input. It is assumed that if input is correct and reflected in output, then the processing itself

is also input. The audit does not check computer processing directly. Traditional auditing methods and techniques are used.

- Auditing through the computer

To check both input and process, audits through the computer can be made. This auditing approach may use test data, auditor-prepared programs, auditor-software packages, or audit programming languages.

- c. Security Policy

Security policies are high-level guidelines concerning information security. Selected from among alternatives, they are dictated by user needs, installation environment, institution regulations, and legal constraints. The Korean Military System will use the following policies:

- The need-to-know policy

This policy restricts information to those people who really need the information in performing their assigned functions. Therefore, all users and programs operate with the least privileged information necessary to perform their function.

- Use of Closed System

In the Korean Military System, access will be allowed only if explicitly authorized.

J. COMPUTER NETWORK

In the Korean Military, many computers will be supplied within the next few years. In the army, computers will be supplied into armies, corps and divisions. In the airforce, computers will be supplied into fighter wings. These computers should be interconnected with the HQ computer of each armed force in order to share and exchange information. For this purpose, the Military System will mainly use a "star network" which enables centralized control and sharing of resources. Therefore, in the army a "star-star network" will be used: Computers at the HQ of the Army and each field unit will be interconnected, computers at the field army and each group, and computers at the group and each division. In the Airforce a "star-network" will be used; computers at HQ of the Airforce and each fighter wing will be interconnected. Such computer networks have dozens of local user terminals connected to each node computer, it is located at the office of each personnel system. These will be used for sending and receiving data. These will mainly consist of terminal keyboards, video display units, input readers, and printers. {Ref. 7}

VI. SYSTEM DYNAMIC

A. THE MODEL

The proposed model is a computer-based military personnel information system model. Objectives of the model are as follows:

- To increase the efficiency of military personnel management.
- To reduce the time, cost and manpower for military personnel management.
- To assign the right man to the right place.
- To manage military personnel fairly.
- To provide well structured military personnel information.
- To generate inquiries and reports from a data base.

The model is classified into three submodels: Assignment system, Promotion system, and Retirement system. The assignment system submodel will provide the officers, who take charge of the assignment function, with information such as assignment outputs of Section A, system requirement of Chapter V, with consideration given to the following:

- Close match between billets and personnel.
- Assign the right man to the right place.
- Assign personnel according to position priority.
- Exchange positions at the opportune time.

The Promotion system submodel will provide the officer, who takes charge of the promotion function with information such

as the promotion outputs of Section A, system requirements of Chapter V, with consideration given to the following:

- Provide precise promotion information of individuals.
- Provide promotion information according to the promotion policy.

The retirement system submodel will provide the officer who takes charge of the retirement function, or retiree with information such as retirement outputs of Section A, System requirements of Chapter V, with consideration given to the following:

- How to decide date of retirement for the retiree.
- How to estimate retirement pay.

B. USE OF THE MODEL

The proposed model will provide military personnel management information to personnel management officers, and will be designed for ease of use by users. Therefore, several features concerning the actual use of the model should be written into the computer program of the model. {Ref. 10} They will be as follows:

- Introduction and instructions

A new user, or a user who wishes to see it, may ask the model to introduce itself and provide instructions and informations on how to use the model correctly. However, users who are familiar with the model may bypass it.

- Special responses for user

When a user forgets the instructions on how to use the model, makes a mistake on a previous response, or wishes

to discontinue running the model, the model will accept special responses which will be provided for these user needs. For example, a "HELP" response causes the model to display on the terminal, or to print the introduction and instructions. A "BACK UP" response causes the model to reask the preceding question. A "QUIT" response causes the model to terminate execution. A "00" response causes the model to terminate input parameter changes.

The system flow is shown in Figure 8, 9, 10, 11. Some of the data, information, and even the computational formulas used in the model are subject to periodic changes, and must be kept up to date. Particularly, if military personnel management policies are revised, the model should be updated. That is, the changes should be incorporated as they occur, and the military personnel information system should be dynamic.

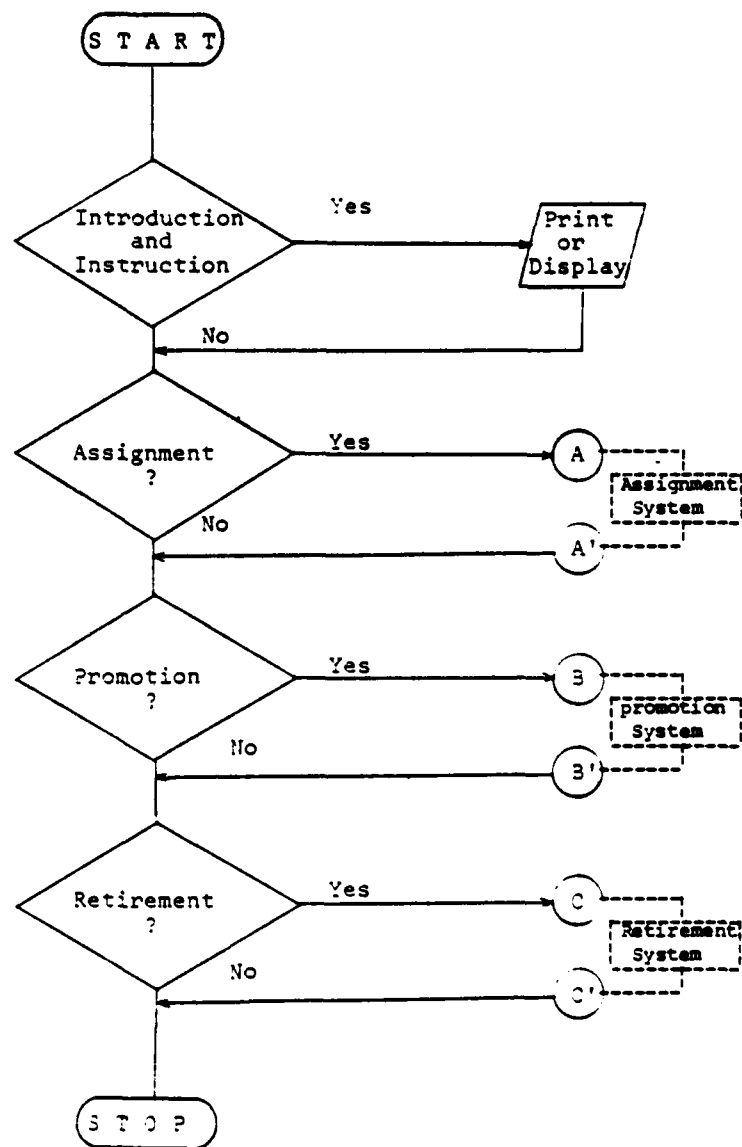


Figure 3. The System Flow Chart

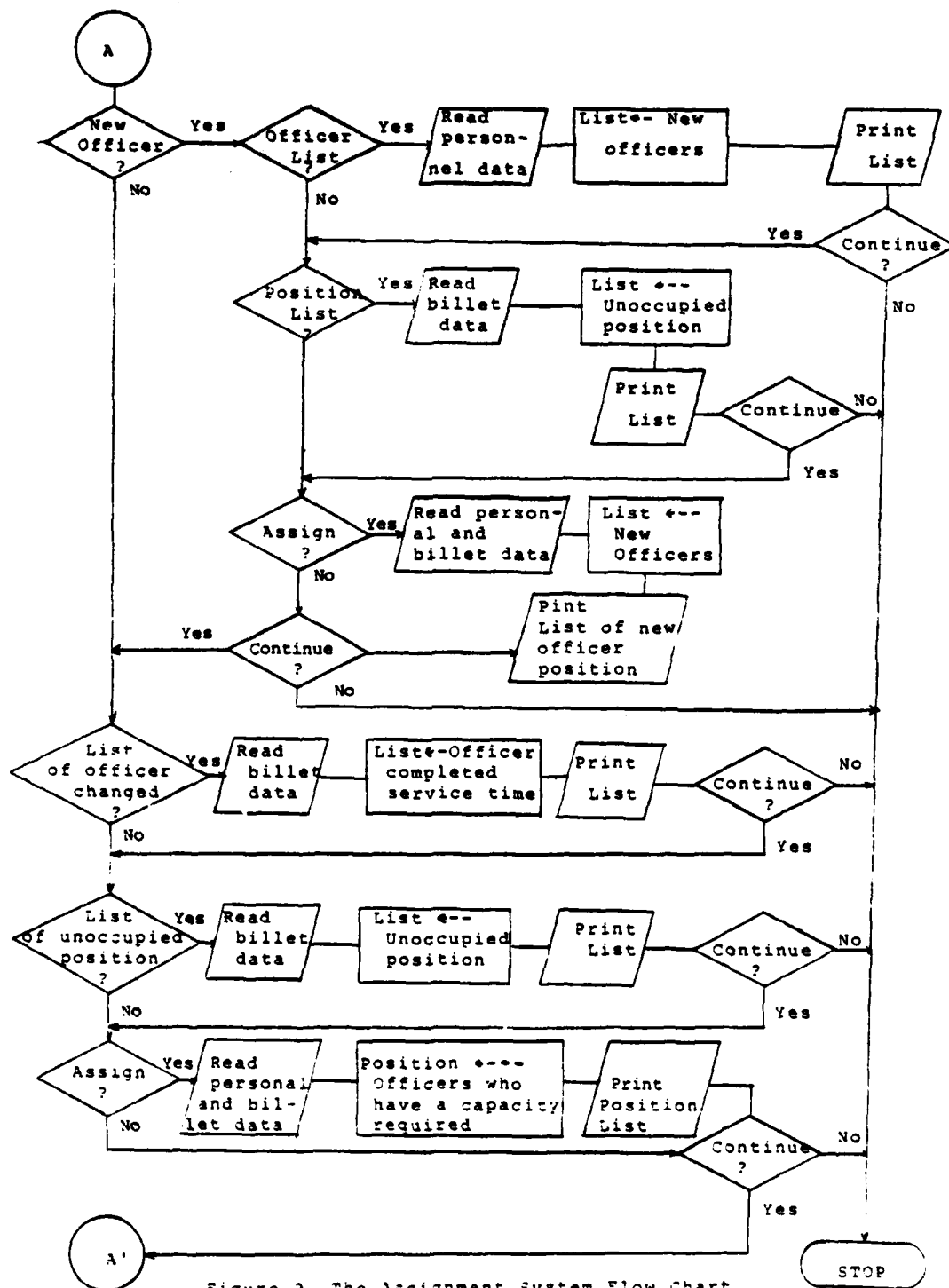


Figure 9 The Assignment System Flow Chart

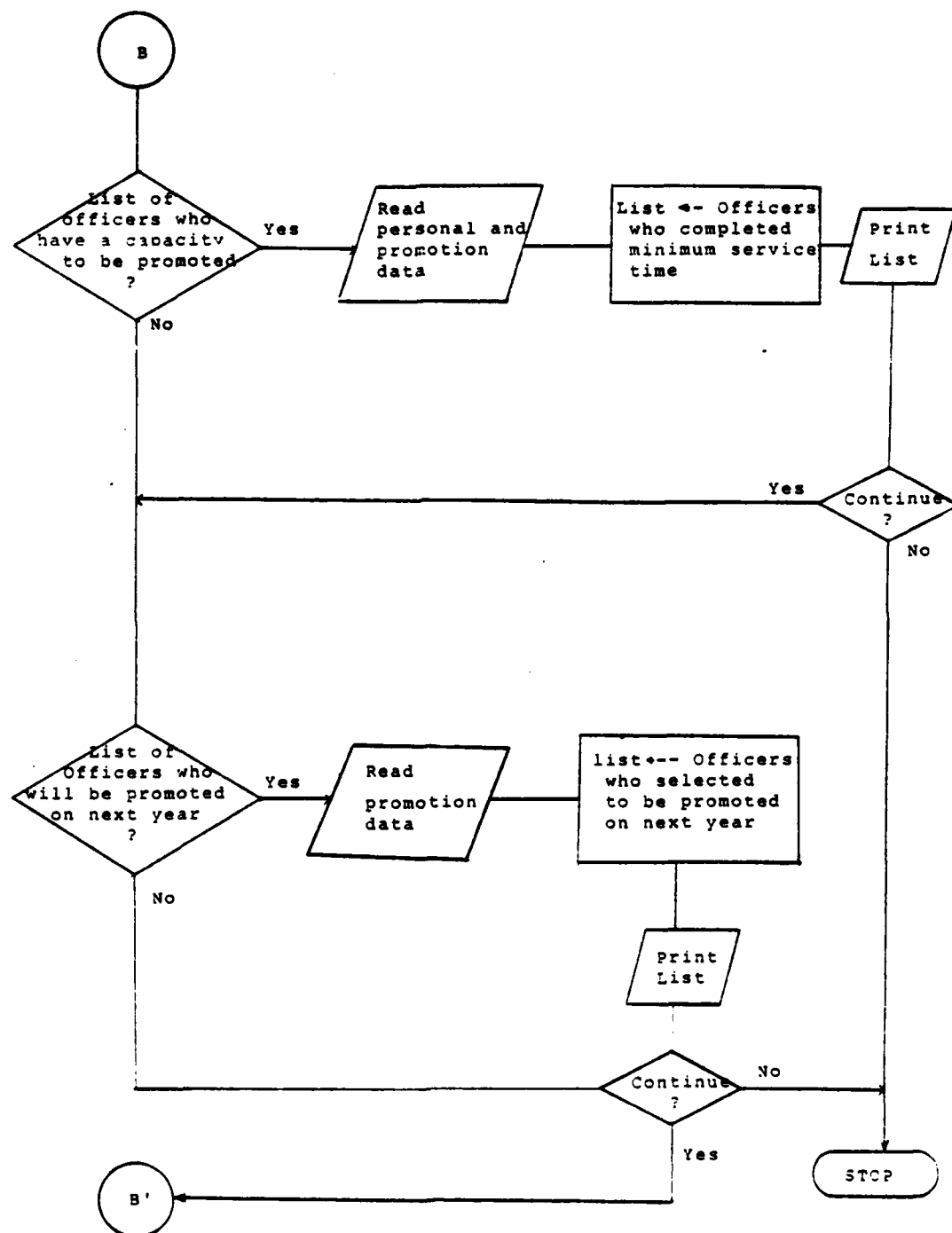


Figure 10. The promotion System Flow Chart

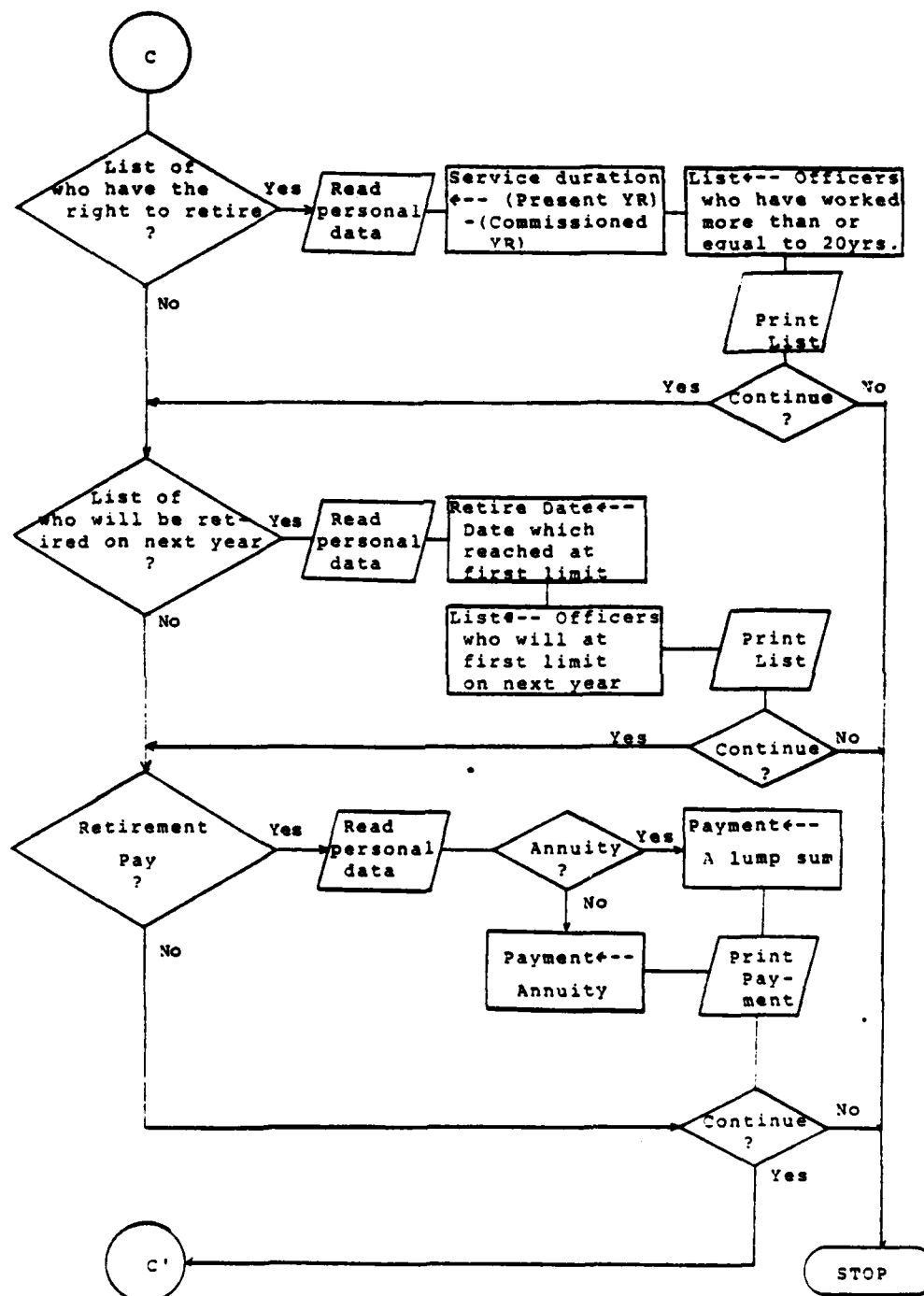


Figure 11. The Retirement System Flow Chart

VII. IMPACTS CAUSED BY THE MILITARY
OFFICER PERSONNEL INFORMATION SYSTEM

The present Korean Military believes it is extremely beneficial to utilize computer-based information system in all military management fields. However, there will be several impacts resulting from personnel information system for officer personnel management as it is applied to the Korean Military. There are:

A. EFFECTS OF THE PERSONNEL INFORMATION SYSTEM ON MANAGEMENT OF MILITARY PERSONNEL

When this system is implemented, the following effects will be expected:

- Much of the work of lower-level management will be programmed and performed by the computer, thereby drastically reducing the number of officers and men required by management. This is a very important aspect because the Korean Military has been directed to reduce the military strength of noncombat fields.
- Personnel information required will be provided more timely and accurately because of computer characteristics, such as speed and accuracy.
- Control functions of personnel management will be more structured, more programmable, more straight forward and, therefore, more receptive to an automated information system. Information Systems have been more effective in the control area than in the planning area.

On the other hand, limited effects of the system will be expected because of the following reasons: {Ref. 9}

- The external and generally unstructured nature of the data required for the type of issues faced by top-level officers. This data is not only unstructured, but nonprogrammed, future oriented, inexact, and external.
- The lack of a general understanding by top-level officers because most of them fail to familiarize themselves with the Management Information System.
- The element of intuition, executive sensitivity. Although more and more of the data elements are being quantified and more of the management process understood and programmed, there is still a factor of intuition with which the computer is incapable of dealing.

B. DEVELOP THE KOREAN MILITARY'S ADP MANAGEMENT

The Korean Military does not presently have a formal automated data processing (ADP) management program. However, as a personnel information system is applied to military officer personnel management, an Automatic Data Processing Management program should keep step with this system. Therefore, a plan for developing a Korean Military ADP Management System will be required.

1. Establishing an ADP Management Strategy

The fundamental management strategy in the Korean Military is centralized policy direction, centralized program execution, and centralized control of resources. Therefore,

the management of ADP in the Korean Military will be highly centralized, and resources will be controlled by the headquarters of each armed force. Particularly, the Korean Military should establish a Computer System Command which will design all ADP systems used by more than one command.

2. Establish an ADP Program Steering Committee

In order to recommend plans, and management strategies, new ADP systems development proposals, and major computer purchases, to the senior ADP policy official on ADP policies computer purchases, an ADP steering committee should be established by the chief of the general staff of each armed force. This committee will be expected to increase top management's involvement in the ADP program and also enable users to participate in the ADP decision-making process.

3. Develop an ADP Plan

A new ADP plan should be published at an early date to determine ADP program objectives, management strategies, and short and long range management actions. The proposed new planning approach will bring top management and user management into the decision-making process at the time when the key "Yes/No" decisions must be made. There will be increased user management participation in defining requirements defending budgets, and analyzing the systems and procedures.

4. Improve ADP Personnel Management

One of the greatest deficiencies in data processing today is the inability of analysts and programmers to improve their skills so they can effectively design and develop

systems which take full advantage of new computer capabilities, and also provide better support to users and reduce over-all costs. Systems developed for punch card equipment are being run on new, third-generation computers, because of the inability of analysts and programmers to redesign them. Therefore, the Korean Military should provide better career management programs which evaluate the capabilities of analysts and programmers, and afford them the opportunity to upgrade their skills and become specialists in certain phases of ADP technology. In addition, the Korean Military should establish a trainee program and obtain young college graduates.

C. REQUIRE A TOTAL PERSONNEL INFORMATION SYSTEM

In implementing this system for Korean Military officer personnel management, the Korean Military will feel the necessity of a total system which will support the varying military personnel information requirements at each level of each active armed force from unit level to headquarters. Therefore, the total system should be incorporated into a single, standardized personnel system for the entire armed forces. The Korean Military should establish projects which achieve this, and integrate this system into the total system.

D. CONVERT THE SYSTEM INTO DSS

The main impact of this system will be on structured tasks where standard operating procedures, decision rules, and information flows will be reliably predefined. The main payoff will be in improving efficiency by reducing costs,

turnaround time, providing rapid and timely personnel information, and by replacing clerical personnel. The personnel manager's decision making function will be indirect by providing reports and access to data. {Ref. 10} This system will focus on information to be aimed at middle managers. Therefore, in order to support the decision making required at all levels of personnel management in the Korean Military, this system should be converted into a Decision Support System (DSS). Accordingly as this system is converted into a DSS, the impact will be on decisions in which there is sufficient structure for computer and analytical aids to be of value, where the personnel manager's judgement is essential. The payoff is in extending the range and capability of personnel manager's decision processes to help them improve their effectiveness. {Ref. 11} The goal for military personnel managers will be the creation of a supportive tool, under their own control, which does not attempt to automate the decision process, predefine objectives, or impose solutions.

VIII. CONCLUSION AND RECOMMENDATION

This thesis has focused upon the Korean Army and Air force, however its findings are applicable to the Korean Navy. The system presented here is based on a computerized personnel information system for military officers only, however it may very well form the basis of the total personnel information system. Once adopted, this system will support the different military personnel information requirements at all levels of the military from the lowest units to headquarters. In addition, system implementation will result in a more effective, timely and accurate presentation of all required personnel information. This will reduce the number of officers and enlisted men presently required to operate current personnel management system and will strengthen all personnel management control functions.

At the earliest stages of installation, the proposed computerized system will be integrated with the existing manual system. In time all hard copy records will be eliminated in favor of computer stored records.

In conclusion, it is strongly recommended that the proposed system be continually reviewed and updated. In this manner the personnel information system will support continuous operations in all states of readiness, from peacetime to war.

APPENDIX A

Assignment Output Report

1. List of Officers who will be changed.

RANK	SERVICE #	NAME(LAST,FIRST)	BRANCH
XXX	XXXXXX	XXXXXXXXXXXXXXXXXX	XX

PRESENT UNIT	PRESENT POSITION	EXPIRATION DATE	TRANSFER UNIT	TRANSFER DATE
XXXXXXXXXX	XX	XXXXXX	XXXXXXXXXX	XX

2. List of positions unoccupied.

UNIT	POSITION	BRANCH	PROFESSION	RANK	ASSIGNMENT DURATION
XXXXXXXXXX	XX	XX	XXX	XXX	XX

FOREIGN LANGUAGE	MILITARY EDUCATION	CIVILIAN EDUCATION	PRIORITY
XXXX	XX	XX	X

3. List of new officers.

RANK	SERVICE #	NAME(LAST,FIRST)	MILITARY ORIENT
XXX	XXXXXX	XXXXXXXXXXXXXXXXXX	XXXX

ASSIGNMENT UNIT	ASSIGNMENT DATE
XXXXXXXXXX	XXXXXX

APPENDIX B

Promotion Output Report

1. List of officers who have a capacity to promote.

RANK	SERVICE #	NAME(LAST,FIRST)	BRANCH	PROFESSION
XXX	XXXXXX	XXXXXXXXXXXXXXXXXX	XX	XXX

MILITARY	RESULT OF FITNESS REPORT								MILITARY
ORIENT	1st	2nd	3rd	4th	5th	6th	7th	AVE.	EDUCATION
XX	X	X	X	X	X	X	X	X	XXXXXX

REWARD	PUNISHMENT	PHYSICAL CONDITION	ORDER RECOMMENDED	PRESENT UNIT
XX	XXX	XX	XXXX	XXXXXXXXXX

2. List of officers selected for promotion.

RANK	BRANCH	SERVICE #	NAME(LAST,FIRST)	PRESENT UNIT
XXX	XX	XXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXX

MILITARY	PROMOTION
ORIENT	DATE
XX	XXXXXX

APPENDIX C

Retirement Output Report

1. List of officers who have the right to retire.

RANK	SERVICE #	NAME(LAST,FIRST)	BRANCH	PROFESSION
XXX	XXXXXX	XXXXXXXXXXXXXXXXXX	XX	XXX

MILITARY ORIENT	SERVICE DURATION	COMMISSION DATE	PROMOTION DATE	DATE OF BIRTH
XX	XX	XXXXXX	XXXXXX	XXXXXX

RETIREMENT
DATE

XXXXXX

2. List of officers who should be retired within this year.

RANK	SERVICE #	NAME(LAST,FIRST)	BRANCH	PROFESSION
XXX	XXXXXX	XXXXXXXXXXXXXXXXXX	XX	XXX

RETIREMENT
DATE

XXXXXX

RETIREMENT
ANNUITY(WON) LUMP(WON)

X,XXX,XXX XX,XXX,XXX

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